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WHITE PINE BLISTER RUST EVALUATION, JEFFERSON NATIONAL FOREST

by

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and

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COVER PHOTOGRAPHS

a. Pycnial stage of white pine blister rust
b. Aecial stage of white pine blister rust

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ABSTRACT

During July and August of 1979, an evaluation of white pine blister rust was made on the Jefferson National Forest to determine the incidence of white pine blister rust and the occurrence of Ribes near white pine on the forest. Fourteen grids, each containing 16 plots, were sampled at random. There were neither rust infection on pine nor occurrence of Ribes on any of the 224 plots examined. Rust infected trees were observed in one location but the infected trees did not fall on the plots. This shows white pine blister rust is very low, localized when present, and that it poses no threat to the white pine forest resource. Management considerations are provided.

INTRODUCTION

Eastern white pine, Pinus strobus, is highly valued for its economic and aesthetic importance as a timber species. The success of white pine can be attributed to an ability to thrive in a variety of forest conditions and to grow rapidly.

White pine blister rust, caused by Cronartium ribicola, has resulted in widespread damage to white pine throughout much of the eastern United States over the course of the century. An alternate host in the genus Ribes is required by Cronartium ribicola to complete its life cycle. The fungal spores from infected Ribes enter white pine through the needles and eventually grow into the bark. Cankers are then formed which can migrate to the trunk and cause death.

For many years, Ribes eradication was viewed as the foremost method of controlling white pine blister rust. As the incidence of blister rust decreased over the years, eradication was eventually stopped. Eradication on the Jefferson National Forest ended in 1969.

The present evaluation was made in July and August of 1979 with objectives of determining the current incidence of blister rust on pine and the occurrence of Ribes around pine on the forest. From the information obtained, conclusions can be drawn regarding the status of blister rust before and after eradication. Management considerations for future control practices can be made after considering the evaluation results and the high economic value of white pine on the forest.

METHODS

To evaluate white pine blister rust on the forest, 14 grids were established randomly. The location of these grids are shown in figure 1. Each grid contained 16 plots, each of which had an area not less than 1/200 acre and not greater than 1/56 acre. In each plot, all trees with living branches within 3 feet of the ground and more than 3 years old were examined. If four trees which qualified for examination could not be found in the 1/200 acre plot, the plot was enlarged up to 1/56 acre until at least four trees were included. A total of 1,435 trees were examined on the 224 plots.

Each tree was examined to determine the presence of rust infection, tree symptom class, tree crown class, age of the tree, d.b.h. of the tree, and the occurrence of Ribes near the tree. The origin of the stand was also determined.

A "yes" was recorded for infected white pines and a "no" was recorded for those trees not infected. The tree symptom class refers to the location and age of infections found. Stem and branch cankers were

recorded separately. The distance between branch cankers and the main stem was recorded, and the age of every canker was recorded. The crown class of each tree was recorded as suppressed, intermediate, or dominant, relative to the amount of overstory present. The age of each tree and the d.b.h. of each tree taller than 4.5 feet was recorded. A height was recorded for trees shorter than 4.5 feet. Finally, the number of Ribes found within 16 feet of the tree and the number found within the area (900 ft.) of the tree was recorded. The stand origin was recorded as natural or planted.

RESULTS

The results of this evaluation are summarized in table 1. There were neither blister rust infection nor occurrence of Ribes on any of the plots examined. Two cankered white pines were observed near the first plot of the first grid. One infected and one uninfected Ribes were found in the area of the 15th plot of the first grid. This represents a very low incidence of infection on the forest. Approximately 74 percent of the 1,435 trees examined were in the suppressed crown class. The average d.b.h. of all trees was 1.81 inches and the average age was 14.6 years. The average elevation of the grids was 2,736 feet. The average stand density was 1,106 trees per acre.

CONCLUSIONS

The incidence of white pine blister rust infection and the occurrence of Ribes on the Jefferson National Forest is not high enough to justify altering normal forest management priorities. However, because of the white pine blister rust found around plot 1, occurrence of rust on permanent plots setup in 1970 and State data, the areas in figure 2 are classified as rust hazard areas. Because of the potential hazard, high value stands, such as seed orchards, should be avoided in these areas.

MANAGEMENT CONSIDERATIONS

1. Practice normal eastern white pine forest management throughout the forest.

2. Because of infection levels found in the areas in figure 2 (previous surveys), avoid using these areas for research, seed orchard developmental work or products such as Christmas trees.

3. Check for Ribes bushes prior to planting in the rust hazard areas and contact Forest Insect and Disease Management for onsite evaluations if Ribes is found.

4. Ribes eradication is not warranted.

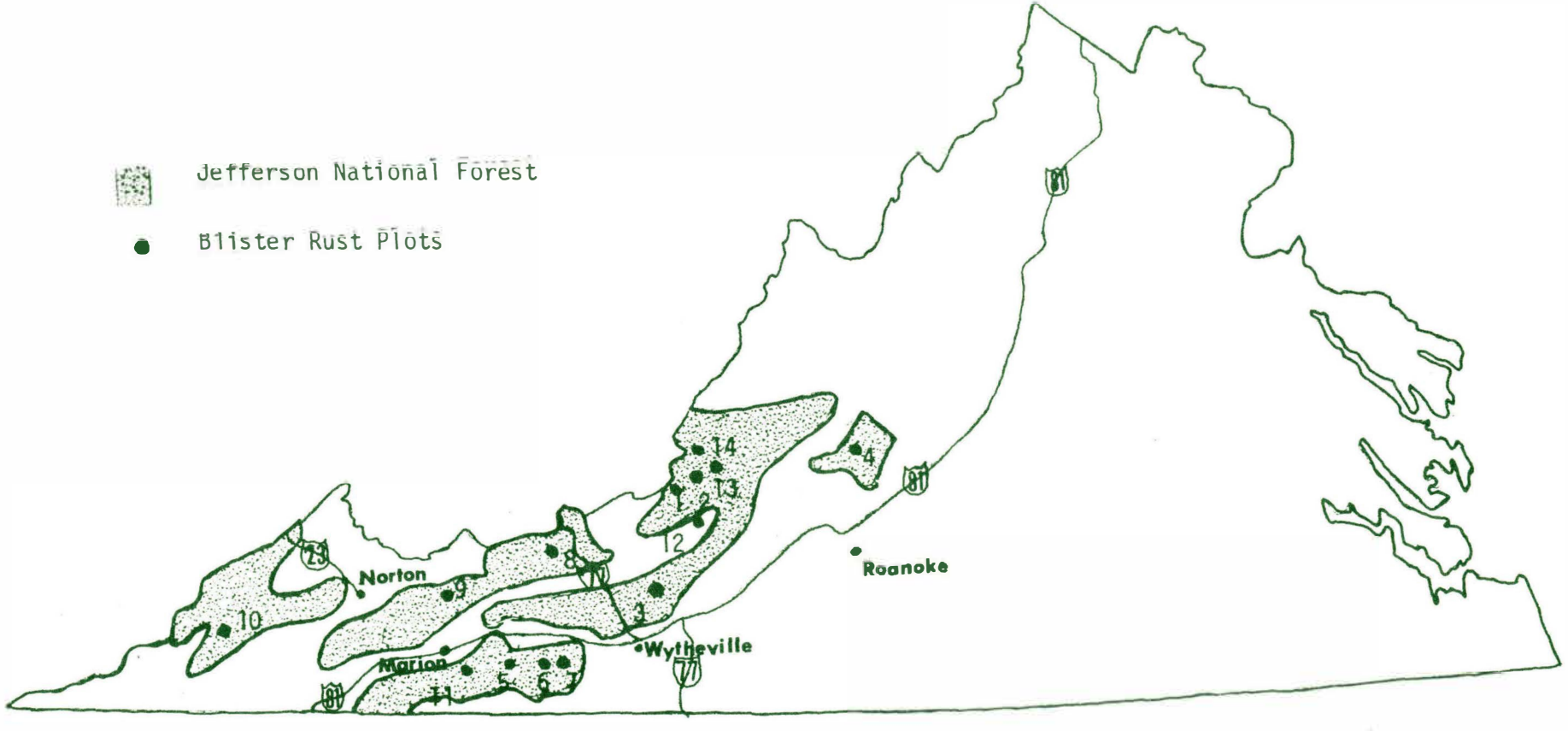

Figure 1. The above map shows the location of blister rust plots relative to Jefferson National Forest land.

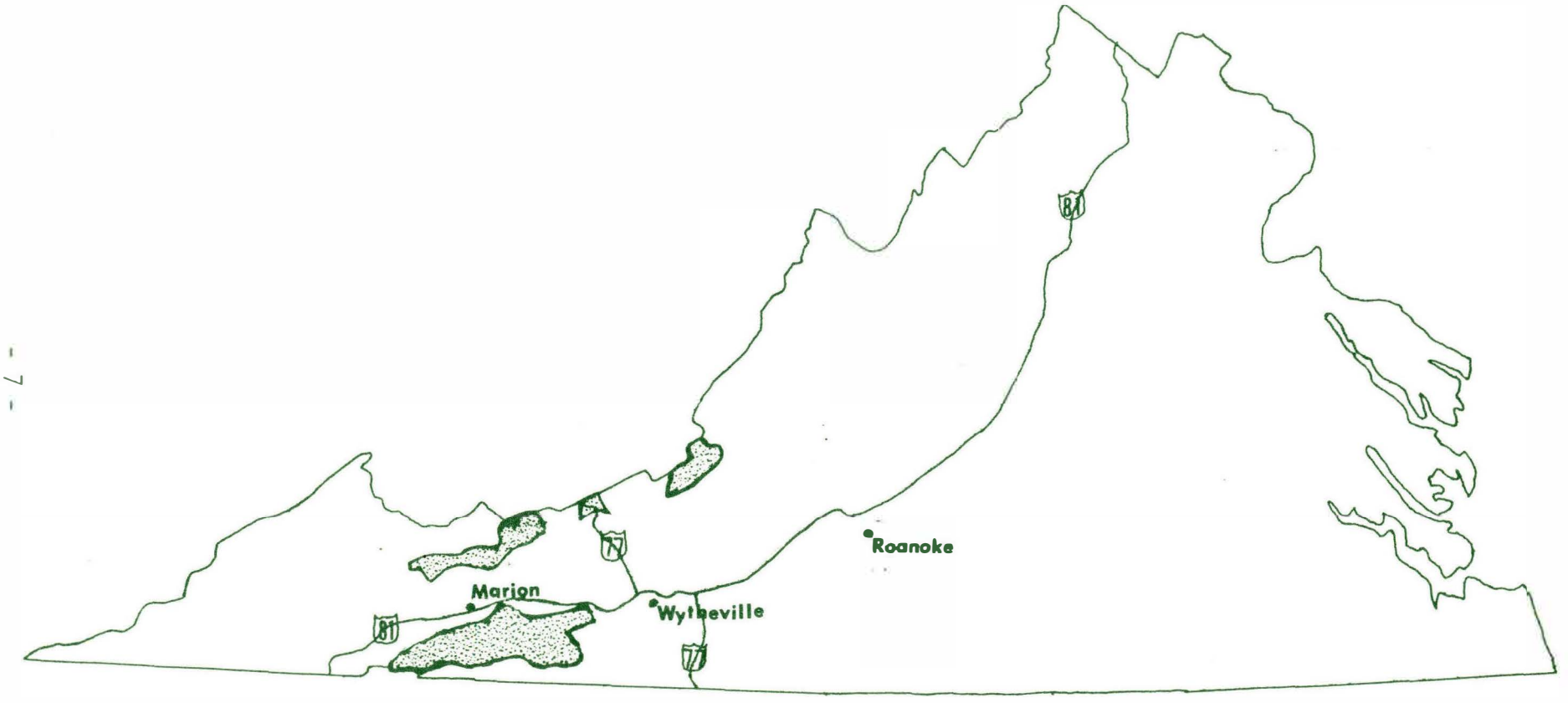

Figure 2. Location of white pine blister rust high hazard areas on the Jefferson National Forest, 1979.

Grid	No. Trees	% Inf.	Crown Class No. uninf. 1	2	3	Crown Class No. inf. 1	2	3	Average d.b.h. Uninf.-Inf.		Density Trees/Ac.	Average age Uninf.-Inf.		Ribes No. Within 16ft. Uninf.-Inf.		Ribes Within Area Uninf.-Inf.		Elevation in ft.
1	113	0	3	56	54	0	0	0	1.15	0	916	13.2	0	0	0	1	1	2500
2	91	0	0	11	80	0	0	0	1.62	0	601	16.8	0	0	0	0	0	2500
3	270	0	0	0	270	0	0	0	0.71	0	3397	7.1	0	0	0	0	0	2500
4	69	0	1	27	41	0	0	0	1.87	0	703	12.2	0	0	0	0	0	1100
5	72	0	0	17	55	0	0	0	1.10	0	721	12.2	0	0	0	0	0	2800
6	152	0	0	24	128	0	0	0	1.46	0	1912	11.3	0	0	0	0	0	2800
7	130	0	0	48	82	0	0	0	1.26	0	1591	10.1	0	0	0	0	0	2500
8	72	0	0	2	70	0	0	0	1.32	0	849	19.1	0	0	0	0	0	2500
9	69	0	10	58	1	0	0	0	2.17	0	469	11.1	0	0	0	0	0	2600
10	64	0	12	52	0	0	0	0	7.23	0	687	14.9	0	0	0	0	0	4000
11	91	0	1	3	87	0	0	0	1.70	0	792	13.2	0	0	0	0	0	3000
12	82	0	0	5	77	0	0	0	1.30	0	922	15.5	0	0	0	0	0	3100
13	70	0	0	13	57	0	0	0	1.50	0	821	25.9	0	0	0	0	0	3000
14	90	0	0	26	64	0	0	0	0.9	0	1098	22.5	0	0	0	0	0	3400
Total	1435	0	27	342	1066	0	0	0	-		--	--	-	-	-	1	1	--
Percent	--		1.9	23.8	79.3	-	-	-	-		--	--	-	-	-	7	7	--
Average	--					-	-	-	1.81		1106	14.58	-	-	-	-	-	2736

Table 1.--Occurrence of white pine blister rust and Ribes on the Jefferson National Forest, 1979.